

**Research Report
KTC-99-62**

**1999 SAFETY BELT USAGE SURVEY
IN KENTUCKY**

by

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November 1999

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EXECUTIVE SUMMARY

The objective of this study was to establish 1999 safety belt and child safety seat usage rates in Kentucky. The 1999 survey continues to document the results after enactment of a statewide mandatory safety belt law in 1994. Data were collected at 200 sites spread across Kentucky. Data from the individual sites were combined into a statewide percentage considering function classification, geographic region, and vehicle miles traveled.

The data show that the usage rate increased in 1999 after a few years where the rate had remained at a stable level below the highest value which occurred in 1994 immediately after enactment of the statewide usage law. The usage rate for front seat occupants was 59 percent in 1999 compared to 54 percent in 1998, 1997 and 1995, 55 percent in 1996, and 58 percent in 1994. The current usage is substantially above the 1993 level, prior to enactment of the statewide law, of 42 percent.

The 1999 statewide usage rate for children under the age of four was determined to be 89 percent. This continues the high rate found for this age category and compares to the previous high of 82 percent in 1997.

The statewide law, except for children, involves secondary enforcement. The higher rate for children could partially be related to primary enforcement. To obtain the maximum possible increase in usage, the current law should be modified to allow primary, rather than secondary, enforcement.

1.0 INTRODUCTION

The use of safety belts and child safety seats has been shown to be an effective means to reduce the injuries of motor-vehicle occupants involved in a traffic accident. There have been various methods used in the attempt to increase safety belt and safety seat usage. Past efforts have included public information campaigns, both local and statewide legislation, and enforcement of the legislation. The most recent legislation in Kentucky in this area was statewide legislation requiring the use of safety belts for all vehicle occupants. This law, which involves secondary enforcement, was passed in 1994 with an effective date in July 1994.

The first legislation in this area was a law enacted by the 1982 Kentucky General Assembly, requiring use of a "child restraint system" for children 40 inches or less in height. The 1988 Kentucky General Assembly strengthened the child restraint law to include a \$50 fine for violation of the law. Also, prior to the statewide law, local safety belt usage laws were enacted in several jurisdictions in Kentucky. The first such local law, with an effective date of July 1990, was enacted by the Lexington-Fayette Rural County Government. The second local law, with an effective date of July 1991, was enacted by the city of Louisville. Jefferson County later adopted such a law. Other cities and one county which had local safety belt ordinances prior to the statewide legislation included Murray, Bowling Green, Kenton County, Corbin, Bardstown, and Midway. Prior to the statewide law, the combined population of the counties and cities having a local ordinance represented approximately one-third of the statewide population. The statewide law replaced the various local ordinances.

Statewide observational surveys were first conducted in Kentucky in 1982, with data collected at 23 sites in 19 cities across the state. These surveys have been conducted annually since 1982 (with the exception of 1987) to document safety belt and safety seat usage in Kentucky. The number of sites was increased to 100 in 1990 in order to obtain a more representative statewide sample. There were some modifications to the 100 sites in 1998 to increase distribution across the state. The number of sites was again increased (to 200 sites) for the 1999 survey with a new sampling plan used to select the sites.

Safety belt usage for drivers increased each survey year from 1982 through 1994. The statewide driver safety belt usage rate was only 4 percent in 1982. It steadily increased to a level of approximately 40 percent in 1991 through 1993. There was a large increase to 58 percent in 1994 after enactment of the statewide law. The first decrease was in 1995 when usage decreased to 54 percent with the rate remaining fairly constant at 55 percent in 1996 and 54 percent in 1997 and 1998. Considering all front seat occupants, the usage rate was also 54 percent in 1997 and 1998.

Statewide usage of child safety seats or safety belts for children under 4 years of age increased from about 15 percent in 1982, before enactment of the mandatory child restraint law, to about 30 percent in 1984, and stayed at this level in 1985 and 1986. After a financial penalty was added to the law, this percentage increased to almost 50 percent in 1988 and 1989, 57 percent in 1990 and 1991, and slightly over 60 percent in 1992 and 1993. There has been a continued general increasing trend in usage with 72 percent in 1994, 66 percent in 1995, 79 percent in 1996, 82 percent in 1997, and 80 percent in 1998.

The objective of the survey summarized in this report was to establish statewide 1999 safety belt and child safety seat usage rates in Kentucky. These rates can be compared to those determined from previous surveys. The 1999 survey will determine whether there has been an increase in the relatively constant level of 1995 through 1998, compared to the high rate in 1994 immediately after enactment of the statewide mandatory safety belt law.

2.0 PROCEDURE

2.1 DATA COLLECTION PROCEDURE

The original data collection procedure used in the surveys, which started in 1982, was first modified in the 1990 survey. The site selection procedure used for the first several surveys was changed in order to obtain a more representative statewide sample, as well as to use a procedure that would be comparable to surveys taken in other states. The data collection form was changed along with the site selection procedure. The procedure and data collection form remained the same for the 1990 through 1998 surveys. A modification in the 1999 survey was that the age and sex of the driver and front seat occupants were not classified. The type of vehicle was coded instead of the age and sex information.

The data collection form used in the 1999 survey is shown in Figure 1. Safety belt usage was recorded for drivers as well as front-seat passengers sitting in the outboard position. These occupant positions are equipped with the combination lap belt/shoulder harness type of safety belt which enables observations to be performed more easily than positions equipped only with a lap belt. The exception was for children under four years of age for which data were collected for both the front and the rear seats.

The type of vehicle was coded for drivers and front seat passengers. Four categories of vehicles were used. These were: passenger car (PC), pickup (PU), van, and sports utility vehicle (SUV).

For drivers and front-seat passengers (over three years of age), usage was classified as either using a harness or belt or not using a restraint. For children one to three years of age, the categories included safety seat, booster seat, harness or belt, or no restraint. For children under one year of age, the categories were either safety seat or no restraint.

Two additional types of information were obtained. Starting with the 1993 survey, the use of motorcycle helmets was noted. The 1997 survey was the first in which the use of bicycle helmets was noted.

Each data collector went through a training period prior to starting the collection of data. As part of the training, the data collectors reviewed the guidelines and previous reports and collected trial sets of field data. The observers then collected data simultaneously at a sample of different types of locations. The data were then reviewed by the project manager before formal data collection was started.

The quality control of the data was the responsibility of the project manager. This included a review of each of the completed data collection forms as the survey progressed to check for any problem areas or questionable data.

The following list of guidelines for data collection was given to each observer.

1. Always include the driver so the number of vehicles included in the sample will be known.
2. Data are collected at intersections with data with each observer collecting data on only one approach at the intersection.
3. Include all vehicles on the approach at low-volume locations. When taking data on a multi-lane road, generally include only vehicles in the curb or near lane unless the traffic volume and roadway geometrics allow data to be collected in the next lane.
4. If traffic volume is too heavy to collect data for all vehicles, record data for the next vehicle in view after recording data for the prior vehicle.
5. Obtain a random sample of vehicles independent of whether the occupants are wearing a safety belt. Do not attempt to include all vehicles having an occupant wearing a safety belt at a location where all vehicles cannot be obtained.

6. Attempt to include data for children under four years of age for any vehicle in the sample in which such a child is a passenger.
7. Only include vehicles either stopped or moving so slowly that the occupants can be readily observed.
8. Excluding children under four years of age, collect data only for drivers and for passengers in the right-front seat (exclude the center front and rear seating positions).
9. Do not include old passenger cars not equipped with a safety belt (typically those vehicles without a head rest).
10. Collect data during daylight hours on weekdays and weekends.
11. Collect two "observer hours" of data at each site. This could be two hours for one approach or one hour for two approaches if the route has two approaches at the intersection.
12. Begin and end data collection at a specified time not considering whether the occupants of the first vehicle are using a safety belt.
13. Collect data for specified types of passenger motor vehicles (cars, pickup trucks, vans, and sport utility vehicles). Data are not collected for combination trucks.
14. Collect data for both in-state and out-of-state vehicles.
15. If a problem such as weather or road construction prevents data from being collected on the assigned day and time for a specific location, a new day and time will be randomly selected by the project manager for data collection.
16. The time period in which data are collected at specific sites are randomly assigned to the data collectors by the project manager. Data are typically collected during weekdays with occasional data collected on a weekend.

Data collection was started in July of 1999 and continued into October. As noted, data were collected for two hours at each location. This consisted of either two hours for one observer or one hour using two observers on different approaches for the specified route. The decision was made to collect data for an equal time period for each location rather than attempt to collect a given sample size.

2.2 DATA COLLECTION LOCATIONS

Data for the surveys collected from 1982 through 1989 were conducted at 23 sites in 19 cities. The cities were selected so that they were distributed across the state. These cities were also selected to represent a range of population categories to account for social and economic factors. In order to be able to relate the survey results to data taken in other states and to include all types of roadways, it was necessary to expand the number of sites to include data in rural locations and for interstates. The initial change started in 1990 and resulted in 100 sites. The distribution of the sites was based on vehicle miles traveled statewide for various categories of roads in counties with varying populations. The variables considered in the 1990 stratification process were the rural or urban designation of the road, the functional classification of the road, vehicle miles traveled, and the county population. However, a new sampling design plan was implemented in 1999 as part of a nationwide effort by the National Highway Traffic Safety Administration (NHTSA) to use a common methodology to select observational sites.

As part of the sampling design plan started in 1999, the decision was made to take survey data at 200 sites. It was also decided that data would be collected at intersections. For interstates and parkways, data were taken at the intersection of a ramp with a cross road. The basis for the decision to collect data at intersections was that it would increase the accuracy of the data since data would be collected for vehicles either stopped or moving slowly. A computer file was used to select the locations. The file is the Highway Performance Monitoring System (HPMS). Characteristics of road segments for all state maintained roads are contained in this file. In order to assure that the sampling design used an acceptable methodology, the various decisions made in the process were made along with NHTSA with the data collection sites selected by NHTSA.

Kentucky has 120 counties ranging in population from slightly over 2,000 to almost 700,000. The NHTSA guidelines allow exclusion from the survey coverage of the least populated units (which would be counties in Kentucky) which represent 15 percent of the state's population. This exclusion reduced the number of counties in the sample from 120 to 65. All the road segments contained in the HPMS file in the counties representing 85 percent of the population were eligible for inclusion in the survey.

Road segments were stratified into three geographical regions based on highway district. There are 12 highway districts in the state. Roadways in each of the three regions were divided into seven roadway functional classification groups. This resulted in 21 stratum from which the sample was selected. The geographical regions were:

- Region 1: Highway Districts 1 through 4 (represents the western portion of the state),
- Region 2: Highway Districts 5 through 7 (covers the north central area of the state which includes the major population centers of Louisville, Lexington, and northern Kentucky), and
- Region 3: Highway Districts 8 through 12 (includes the eastern and south central portion of the state)

There are 44 counties in Region 1, 31 in Region 2, and 45 in Region 3. The state's population is divided into 29 percent in Region 1, 46 percent in Region 2, and 25 percent in Region 3. For reporting purposes, Region 1 is referred to as the West, Region 2 as the North, and Region 3 as the East. The location of these regions are shown in Figure 2.

The following seven functional classification categories were used:

1. rural interstate,
2. rural principal arterial,
3. rural minor arterial/major collector,
4. rural minor collector/local,
5. urban interstate/freeway,
6. urban principal arterial, and
7. urban minor arterial/collector/local.

Selections were made from roadway segments which contained either an interchange, an intersection with a stop sign, an intersection with a traffic signal, or a combination of these. A segment could contain more than one intersection or interchange. If a segment had more than one intersection with a stop sign or signal or interchange, one of the intersections or interchanges was randomly selected. For example, if a segment had three intersections with signals, a separate number of one, two, or three would be randomly selected. The random number would assign which of the intersections to be selected along the route as it was driven in its cardinal direction.

An equal probability selection (simple random sample) of the road segments were made within each of the 21 strata using the HPMS file as the source of the necessary road segment information. Following is the number of segments selected in each strata.

	<u>Region 1</u>	<u>Region 2</u>	<u>Region 3</u>	<u>All</u>
Rural Interstate	8	12	6	26
Rural Principal Arterial	12	6	12	30
Rural Minor Arterial/ Major Collector	12	10	12	34
Rural Minor Collector/Local	8	6	8	22
Urban Interstate/Freeway	6	20	2	28
Urban Principal Arterial	10	14	6	30
Urban Minor Arterial/ Collector/Local	10	14	6	30
All	66	82	52	200

For each selected road segment, information was printed from the HPMS file to be used to select a specific location for data collection. This information included the county, route, beginning and ending milepoint, the number of intersections or interchanges within the segment, and a counter showing which intersection or interchange to select if there was more than one within the segment.

A list of the 120 counties in Kentucky along with their population, the number of sites in each county, and their region in the state is given in Appendix A. A road segment was selected in 58 counties. The largest number of segments was 20 in Jefferson County. A list of the intersections where data was collected within each of these segments is given in Table 1. For each site, the county, route, and intersecting route (or exit number for an interstate or parkway) is given. The nearest town to the data collection site is also listed along with the geographical region and functional classification. Data were collected at the intersection of the ramps and intersecting road at interchanges.

2.3 SURVEY DATA ANALYSIS

As part of the summary of information from the HPMS file for each randomly selected roadway segment, the functional classification, region, and vehicle miles traveled were listed. The total vehicle miles for the road segments in each of the 21 stratum were also summarized to be used in the estimation process.

The survey data were input into an EXCEL spreadsheet to summarize the data and obtain the results. The results for each survey site were reviewed to determine if there were any possible problems with either the data collection or input. The computer results were checked manually if a potential problem was observed. A second set of data was collected if the data at a specific site was inconsistent with other data.

Safety belt usage rates were determined for the driver and for all front-seat occupants. Rates were also obtained by vehicle type for both the driver and all front-seat occupants. For children under four years of age, usage rates were obtained for both front- and rear-seating positions, as well as for combined seating positions. Statewide rates were obtained, using an EXCEL spreadsheet analysis, by weighting the usage determined for each location by the vehicle miles traveled in the road segment.

Various usage rates were determined for each location. The rates were for all front seat passengers, drivers, front-seat occupants, and all children under four years of age (front and rear). The rate for each of the 21 stratum (based on region and functional classification categories) were determined by weighting the usage rate for each location by the proportion of the vehicle miles traveled at that location of the vehicle miles at all observational sites in the stratum.

A statewide rate was then determined using the usage rate determined for each stratum and the total vehicle miles traveled in that stratum (statewide for the counties representing 85 percent of the population). The statewide rate was the sum of the products of the usage rate for each stratum and the proportion of the vehicle miles traveled in that stratum of the total statewide vehicle miles.

A consultant was used to conduct the various statistical tests. The variance, bound on the error of estimation (which is half of the 95 percent confidence interval), and relative error were calculated for the statewide usage rate for all front seat passengers. This data were also determined for each of the 21 strata, the three regions, and the seven functional classes. The software used was SAS for Windows, version 6.12. The relative error and confidence interval was also determined for each location for the usage rate of all front seat occupants.

3.0 SURVEY RESULTS

Usage rates for all front seat occupants (drivers and passengers) for the various types of highways and regions of the states are summarized in Table 2. The overall statewide rate in 1999, using the data collected at 200 sites and the described weighting procedure, was 58.6 percent. The 95 percent confidence interval was 0.5 percent. The sample size of all front seat occupants was 99,856. The usage rate by region varied from 61.9 percent in Region 2 (north) to 50.0 percent in Region 3 (east) with 59.4 percent in Region 2 (west). The highest rate by the functional classification of the highway was 65.7 percent for rural interstates with the lowest 49.2 percent for rural minor collector/local roads. The relative error and confidence interval for the usage rates found for all front seat occupants (by region and highway functional classification) are given in Appendix B.

Usage rates for drivers for the various types of highways and regions of the state are summarized in Table 3. The overall statewide rate for drivers in 1999 was 59.4 percent. Drivers accounted for 78 percent of front seat occupants so they dominated the percentage determined for all front seat occupants. Usage rates for front seat passengers was 55.6 percent (Table 4).

Usage rates for children under four years of age are given in Table 5. These rates are for children in both the front and the rear seats. The usage rate for children under one year of age (92.5 percent) was higher than that for children one to three years of age (88.7 percent). The usage rate for the combination of these categories, or children under four years of age, was 89.2 percent.

The sample size for children under four years of age was 1,385. This age category corresponds to the children for which the mandatory child restraint law would apply. The 1999 usage rate of 89.2 percent compares to 80 percent in 1998, 82 percent in 1997, 79 percent in 1996, 66 percent in 1995, 72 percent in 1994, 61 percent in 1993, 62 percent in 1992, and 57 percent in 1990 and 1991. This percentage was about 15 percent in 1982 before enactment of the child restraint law, increased to approximately 30 percent after enactment of the law having no penalty, and increased again to almost 50 percent in 1988 after the addition of a monetary penalty to the child restraint law.

The usage rate for children under four years of age was higher in the rear seat compared to the front seat. For children one to three years of age, the usage rate was 91 percent for the rear seat compared to 58 percent for the front seat. For children under one year old, the usage rate was 98 percent for the rear seat compared to 77 percent for the front seat. The large percentage of children were observed in the rear seat for both age groups (about 79 percent). This compares to 80 percent in the rear seat in 1998, 75 percent in 1997, and 57 percent in 1996.

A summary of the data collected is given in Appendix C. For each of the 200 data sites, the usage rate and sample size are given for all front seat occupants, drivers, front-seat passengers, and children under four years of age (both front and rear seat). The relative error and confidence interval is given for the "all front seat occupant" category. Usage rates for front seat occupants ranged from 26 percent to 78 percent. There were three sites which had a usage rate of under 30 percent and all of those sites were in the rural minor collector/local category. There were 17 sites which had a usage rate of 70 percent or above with 15 of these an interstate or parkway location. There were only 11 sites with a usage rate under 40 percent.

While the data collection procedure changed in 1990 and 1999, the usage rate may still be compared to the statewide rates from past years (Table 6). The previous studies showed that statewide driver usage rates had steadily increased from 4.2 percent in 1982 to 42 percent in 1993. However, the amount of the increase had decreased. Only a three percentage point increase occurred in the two-year period from 1991 to 1993. The 58 percent usage in the 1994 survey showed that a dramatic increase occurred between the 1993 and 1994 data collection periods. This increase was directly related to the enactment of a statewide safety belt law. The 1995 survey showed that driver usage (54 percent) remained substantially higher than before enactment of the law, but there was a slight decrease in usage from the rate immediately after enactment of the law. This trend continued through 1998 before the increase to 59 in 1999.

A substantial difference in usage rate (for all front seat occupants) was noted when vehicle type is considered (Table 7). The rate varied from substantially from 65.6 percent for sport utility vehicles down to 42.0 percent for pickup trucks. The rate for passenger cars and vans were both about 63 percent. It can be seen that use of safety belts is much lower in pickup trucks than any other vehicle type.

Helmet use by motorcyclists was collected as part of the survey. Kentucky had a statewide law requiring the use of a helmet by a motorcyclist until it was repealed starting July 15, 1998. The results of past surveys had found a usage rate of over 95 percent. The 1998 data were taken both before and after the effective date of the repeal. Prior to July 15, 1998 only 10 of the 240 observed motorcyclists were not wearing a helmet, giving a usage rate of 96 percent. After this date, 29 of 148 motorcyclists were observed not wearing a helmet giving a usage rate of 76 percent. In 1999, 164 of 452 motorcyclists were observed not wearing a helmet. The weighted usage rate was 65 percent. The effect of the repeal of the helmet law is obvious with the usage rate continuing to decrease. The usage rate did not vary substantially across the state with 62 percent in the west region, 67 percent in the north, and 64 percent in the east.

Bicycle helmet use was observed for 84 bicyclists. Only 10 of these bicyclists were wearing a helmet. This low rate (12 percent) shows the need for additional public information about this subject. This rate compares to 9 percent in 1998 and 8 percent in 1997.

4.0 SUMMARY

Observations were taken at 200 sites across Kentucky to obtain safety belt usage rates. A sample of 99,856 front seat occupants was obtained (including 78,109 drivers). The data collection procedure and site selection criteria were based on national criteria.

A statewide safety belt law was passed in Kentucky in 1994. The law applies to all vehicle occupants. Prior to the statewide law, there were local ordinances passed in several cities and counties which covered approximately one-third of the statewide population. The data collected in 1994, after the effective date of the statewide law, showed that enactment of the statewide law had a dramatic effect on usage rates. The usage rate for front seat occupants increased from 42 percent in 1993 to 58 percent in 1994. It then decreased slightly to 54 to 55 percent in 1995 through 1998. The survey data collected in 1999 show that the rate has increased to a level similar to that found immediately after enactment of the statewide law (58.6 percent). The trend in usage rates from 1982 through 1999 is given in Table 6.

The usage rate was highest in the region of the state which included the largest population centers (Louisville, Lexington, and northern Kentucky). Usage was highest on interstates and lowest on local roads. When type of vehicle was considered, usage was highest for sport utility vehicles and lowest for pickup trucks.

Kentucky had a statewide law requiring children under 40 inches in height to be placed in a child restraint prior to the law applying to all occupants and this law involves primary, rather than secondary, enforcement. The statewide usage rate for children under the age of four (including both the front and rear seat) was determined to be 89.2 percent. This compares to 80 percent in 1998 survey and continues to show the high usage for this age group.

The motorcycle helmet law was repealed in 1998. There had been a very high compliance of motorcyclists with the requirement to wear a helmet (over 95 percent), but the helmet usage percentage was reduced to 65 percent in 1999. The percentage of bicyclists observed wearing a safety helmet was very low (12 percent).

5.0 RECOMMENDATIONS

The data show that the level of safety belt usage in 1999 has increased to the level which occurred immediately after enactment of the statewide safety belt law in 1994. The usage rate in 1999 was the first increase after the relatively constant rates in 1995 through 1998 which were slightly lower than 1994 level. This increase can be related to increased efforts in the areas of both education and enforcement. Public information and education concerning the law and the reasons to wear safety belts should continue. Also, enforcement of the law, along with public information about this enforcement and resulting citations, should continued to be increased.

The survey data can be used to identify areas in need of additional enforcement and education. Specifically, usage was lowest in the east region of the state. Also, usage was substantially lower for occupants of pickup trucks compared to other vehicle types.

The benefits which can be gained through education and enforcement of a secondary law is somewhat limited. The very high usage for children can be partially attributed to primary enforcement. To obtain the maximum possible usage for all vehicle occupants, the current law should be modified to allow primary, rather than secondary, enforcement.

Figure 1. Data Collection Form

SAFETY BELT DATA COLLECTION FORM

Date: _____ Starting Time: _____ Ending Time: _____ Int #: _____
 Location: _____ Sheet #: _____
 Observer: _____ Comment: _____

DRIVER USAGE

Vehicle	Harness or Belt	None
PC		
PU		
VAN		
SUV		

FRONT-SEAT OCCUPANT USAGE (OVER 3 YEARS OF AGE)

Vehicle	Harness or Belt	None
PC		
PU		
VAN		
SUV		

USAGE FOR CHILDREN (1-3 YEARS OF AGE)

Position	Safety Seat	Booster Seat	Harness or Belt	None
FRONT				
REAR				

USAGE FOR INFANTS (UNDER 1 YEAR OF AGE)

Position	Safety Seat	None
FRONT		
REAR		

USAGE OF MOTORCYCLE HELMET

YES	No

USAGE OF BICYCLE HELMET

YES	No

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Table 1. SURVEY LOCATIONS

<u>Site Number</u>	<u>Region</u>	<u>Functional Classification</u>	<u>County</u>	<u>Intersection Description</u>	<u>Nearest Town</u>
1	West	Rural Interstate	Simpson	I-65 at Exit 6	Franklin
2	West	Rural Interstate	Christian	I-24 at Exit 73	Newstead
3	West	Rural Interstate	Barren	I-65 at Exit 48	Cave City
4	West	Rural Interstate	Hardin	I-65 at Exit 81	White Mills
5	West	Rural Interstate	Barren	I-65 at Exit 53	Cave City
6	West	Rural Interstate	Hardin	I-65 at Exit 102	Colesburg
7	West	Rural Interstate	Marshall	I-24 at Exit 27	Lake City
8	West	Rural Interstate	Simpson	I-65 at Exit 2	Franklin
9	West	Rural Principal Arterial	Hardin	Bluegrass Parkway at Exit 8	Boston
10	West	Rural Principal Arterial	Marion	US 68 at KY 208	Lebanon
11	West	Rural Principal Arterial	Meade	US 31W at KY 1638	Muldraugh
12	West	Rural Principal Arterial	Warren	US 231 at KY 622	Plano
13	West	Rural Principal Arterial	Hopkins	Western Kentucky Parkway at Exit 24	Dawson Springs
14	West	Rural Principal Arterial	Hopkins	Pennyrile Parkway at Exit 33	Nortonville
15	West	Rural Principal Arterial	Grayson	Western Kentucky Parkway at Exit 107	Leitchfield
16	West	Rural Principal Arterial	Marshall	Purchase Parkway at Exit 27	Benton
17	West	Rural Principal Arterial	Marshall	US 641 at KY 58	Benton
18	West	Rural Principal Arterial	Marshall	US 68 at US 641	Benton
19	West	Rural Principal Arterial	Graves	US 45 at KY 1276	Mayfield
20	West	Rural Principal Arterial	Marshall	US 641 at US 60	Benton
21	West	Rural Minor Arterial/Major Collector	Barren	US 31E at KY 70	Cave City
22	West	Rural Minor Arterial/Major Collector	Marion	KY 426 at US 68/KY 55	Lebanon
23	West	Rural Minor Arterial/Major Collector	Barren	US 31W at KY 90	Cave City
24	West	Rural Minor Arterial/Major Collector	McCracken	KY 286 at US 62	Paducah
25	West	Rural Minor Arterial/Major Collector	McCracken	KY 305 at KY 358	Paducah
26	West	Rural Minor Arterial/Major Collector	Muhlenburg	KY 189 at US 62	Greenville
27	West	Rural Minor Arterial/Major Collector	Grayson	KY 259 at US 62	Leitchfield
28	West	Rural Minor Arterial/Major Collector	Muhlenburg	US 431 at KY 109	Central City
29	West	Rural Minor Arterial/Major Collector	Grayson	KY 259 at W. Lake	Leitchfield
30	West	Rural Minor Arterial/Major Collector	Breckinridge	KY 79 at KY 259	McDaniels
31	West	Rural Minor Arterial/Major Collector	Grayson	KY 79 at US 62	Caneyville
32	West	Rural Minor Arterial/Major Collector	Logan	US 431 at KY 663	Russellville
33	West	Rural Minor Collector/Local	Taylor	KY 3183 at KY 458	Campbellsville
34	West	Rural Minor Collector/Local	Logan	KY 1038 at KY 103	Russellville
35	West	Rural Minor Collector/Local	Henderson	KY 1217 at KY 1299	Hardinsburg
36	West	Rural Minor Collector/Local	Taylor	KY 527 at KY 3212	Campbellsville
37	West	Rural Minor Collector/Local	Logan	US 68X at US 79	Russellville
38	West	Rural Minor Collector/Local	Muhlenburg	US 62 at KY 189	Greenville
39	West	Rural Minor Collector/Local	Barren	KY 677 at KY 740	Three Springs
40	West	Rural Minor Collector/Local	Meade	KY 144 at KY 259	Rhodelia
41	West	Urban Interstate/Freeway	Hardin	Western Kentucky Parkway at Exit 136	Elizabethtown
42	West	Urban Interstate/Freeway	Hardin	I-65 at Exit 94	Elizabethtown
43	West	Urban Interstate/Freeway	Christian	Pennyrile Parkway at Exit 8	Hopkinsville
44	West	Urban Interstate/Freeway	Hopkins	Pennyrile Parkway at Exit 44	Madisonville
45	West	Urban Interstate/Freeway	Daviess	US 60B at US 431	Owensboro
46	West	Urban Interstate/Freeway	Daviess	William Natcher Parkway at Exit 70	Owensboro
47	West	Urban Principal Arterial	McCracken	US 60 at I-24	Paducah
48	West	Urban Principal Arterial	Daviess	US 431 at 2nd Street	Owensboro
49	West	Urban Principal Arterial	Nelson	US 31E at KY 1430	Bardstown
50	West	Urban Principal Arterial	Barren	US 31E at US 68	Glasgow

Table 1. SURVEY LOCATIONS (continued)

<u>Site Number</u>	<u>Region</u>	<u>Functional Classification</u>	<u>County</u>	<u>Intersection Description</u>	<u>Nearest Town</u>
51	West	Urban Principal Arterial	McCracken	US 60 at Bridge Street	Paducah
52	West	Urban Principal Arterial	Warren	US 68/80 at KY 880	Bowling Green
53	West	Urban Principal Arterial	Warren	US 68/80 at Main Ave.	Bowling Green
54	West	Urban Principal Arterial	Henderson	US 41A at 5th St.	Henderson
55	West	Urban Principal Arterial	Barren	US 31E at KY 90	Glasgow
56	West	Urban Principal Arterial	Hardin	US 31W at KY 1600	Elizabethtown
57	West	Urban Minor Arterial/Collector/Local	Hardin	KY 3005 at KY 1357	Elizabethtown
58	West	Urban Minor Arterial/Collector/Local	Barren	KY 63 at 31ex	Glasgow
59	West	Urban Minor Arterial/Collector/Local	McCracken	KY 787 at US 62	Paducah
60	West	Urban Minor Arterial/Collector/Local	McCracken	KY 994 at Schneidman Rd.	Paducah
61	West	Urban Minor Arterial/Collector/Local	Logan	KY 3233 at US 79 & US 431 Truck Rte.	Russellville
62	West	Urban Minor Arterial/Collector/Local	Henderson	KY 136 at US 41	Henderson
63	West	Urban Minor Arterial/Collector/Local	Calloway	KY 1637 at 16th	Murray
64	West	Urban Minor Arterial/Collector/Local	McCracken	US 45 at 13th St.	Paducah
65	West	Urban Minor Arterial/Collector/Local	McCracken	US 45X at Clay Ave. (6th)	Paducah
66	West	Urban Minor Arterial/Collector/Local	McCracken	KY 994 at US 60/62	Paducah
67	North	Rural Interstate	Clark	I-64 at Exit 98	Winchester
68	North	Rural Interstate	Boone	I-75 at Exit 175	Independence
69	North	Rural Interstate	Oldham	I-64 at Exit 22	LaGrange
70	North	Rural Interstate	Montgomery	I-64 at Exit 113	Mt. Sterling
71	North	Rural Interstate	Boone	I-75 at Exit 171	Walton
72	North	Rural Interstate	Boone	I-275 at Exit 11	Covington
73	North	Rural Interstate	Shelby	I-64 at Exit 43	Waddy
74	North	Rural Interstate	Franklin	I-64 at Exit 153	Frankfort
75	North	Rural Interstate	Bullitt	I-65 at Exit 116	Shepardsville
76	North	Rural Interstate	Shelby	I-64 at Exit 28	Simpsonville
77	North	Rural Interstate	Scott	I-64 at Exit 69	Georgetown
78	North	Rural Interstate	Oldham	I-71 at Exit 14	Brownsboro
79	North	Rural Principal Arterial	Boyle	US 150 at US 127 Bypass	Danville
80	North	Rural Principal Arterial	Woodford	US 60 at US 62	Versailles
81	North	Rural Principal Arterial	Scott	US 460 at US 62	Georgetown
82	North	Rural Principal Arterial	Woodford	Bluegrass Parkway at Exit 68	Versailles
83	North	Rural Principal Arterial	Jessamine	US 27 at US 27X	Nicholasville
84	North	Rural Principal Arterial	Bullitt	US 31E at KY 44	Mt. Washington
85	North	Rural Minor Arterial/Major Collector	Mercer	KY 33 at US 68	Wilmore
86	North	Rural Minor Arterial/Major Collector	Oldham	KY 22 at KY 53	LaGrange
87	North	Rural Minor Arterial/Major Collector	Boone	KY 14 at KY 16	Verona
88	North	Rural Minor Arterial/Major Collector	Oldham	KY 146 at KY 1817	La Grange
89	North	Rural Minor Arterial/Major Collector	Clark	KY 418 at KY 3371	Winchester
90	North	Rural Minor Arterial/Major Collector	Kenton	KY 536 at KY 177	Visalia
91	North	Rural Minor Arterial/Major Collector	Shelby	KY 44 at KY 53	Shelbyville
92	North	Rural Minor Arterial/Major Collector	Grant	KY 467 at KY 22	Dry Ridge
93	North	Rural Minor Arterial/Major Collector	Scott	KY 32 at US 25	Sadieville
94	North	Rural Minor Arterial/Major Collector	Jefferson	US 60 at Beckley Station Road	Louisville
95	North	Rural Minor Collector/Local	Montgomery	KY 646 at KY 11	Mt. Sterling
96	North	Rural Minor Collector/Local	Montgomery	KY 1991 at KY 537	Mt. Sterling
97	North	Rural Minor Collector/Local	Boyle	KY 1273 at US 150	Danville
98	North	Rural Minor Collector/Local	Franklin	KY 2820 at US 127	Frankfort
99	North	Rural Minor Collector/Local	Campbell	KY 739 at KY 9	Mentor
100	North	Rural Minor Collector/Local	Jessamine	KY 3433 at KY 29	Wilmore

Table 1. SURVEY LOCATIONS (continued)

<u>Site Number</u>	<u>Region</u>	<u>Functional Classification</u>	<u>County</u>	<u>Intersection Description</u>	<u>Nearest Town</u>
101	North	Urban Interstate/Freeway	Jefferson	I-64 at Exit 2	Louisville
102	North	Urban Interstate/Freeway	Jefferson	I-264 at Exit 16	Louisville
103	North	Urban Interstate/Freeway	Jefferson	I-64 at Exit 3rd St.	Louisville
104	North	Urban Interstate/Freeway	Fayette	I-64 at Exit 87	Lexington
105	North	Urban Interstate/Freeway	Jefferson	I-265 at Exit 12	Louisville
106	North	Urban Interstate/Freeway	Campbell	I-275 at Exit 77	Wilder
107	North	Urban Interstate/Freeway	Fayette	I-75 at Exit 99	Lexington
108	North	Urban Interstate/Freeway	Jefferson	I-265 at Exit 27	Louisville
109	North	Urban Interstate/Freeway	Boone	I-75 at Exit 180	Erlanger
110	North	Urban Interstate/Freeway	Kenton	I-64 at Exit 186	Crescent Springs
111	North	Urban Interstate/Freeway	Jefferson	I-64 at Exit 17	Louisville
112	North	Urban Interstate/Freeway	Clark	I-64 at Exit 96	Winchester
113	North	Urban Interstate/Freeway	Fayette	I-75 at Exit 108	Lexington
114	North	Urban Interstate/Freeway	Campbell	US 471 at Exit 2	Ft. Thomas
115	North	Urban Interstate/Freeway	Jefferson	I-264 at Exit 22	Louisville
116	North	Urban Interstate/Freeway	Kenton	I-275 at Exit 83	Erlanger
117	North	Urban Interstate/Freeway	Jefferson	I-65 at Exit 127	Louisville
118	North	Urban Interstate/Freeway	Kenton	I-75 at Exit 184	Erlanger
119	North	Urban Interstate/Freeway	Boone	I-275 at Exit 7	Hebron
120	North	Urban Interstate/Freeway	Jefferson	I-264 at Exit 5	Louisville
121	North	Urban Principal Arterial	Jefferson	US 31W at KY 841	Louisville
122	North	Urban Principal Arterial	Jefferson	US 31E at First St.	Louisville
123	North	Urban Principal Arterial	Fayette	Euclid Ave. at Upper St. (US 27)	Lexington
124	North	Urban Principal Arterial	Campbell	US 27 at KY 8 (4th St.)	Newport
125	North	Urban Principal Arterial	Scott	US 460 B at US 460	Georgetown
126	North	Urban Principal Arterial	Fayette	US 68 at Ft. Harrod Dr.	Lexington
127	North	Urban Principal Arterial	Jefferson	US 150 at 18th St.	Louisville
128	North	Urban Principal Arterial	Jefferson	KY 1934 at KY 1230	Louisville
129	North	Urban Principal Arterial	Jefferson	US 31E at Tyler Lane	Louisville
130	North	Urban Principal Arterial	Jefferson	US 31W at Garrs Lane	Louisville
131	North	Urban Principal Arterial	Jefferson	US 31W at Ashby Lane	Louisville
132	North	Urban Principal Arterial	Jefferson	US 150 at Clay Ave.	Louisville
133	North	Urban Principal Arterial	Kenton	KY 16 at West 34th St.	Newport
134	North	Urban Principal Arterial	Campbell	KY 1120 at US 27	Newport
135	North	Urban Minor Arterial/Collector/Local	Woodford	US 60X at US 60	Versailles
136	North	Urban Minor Arterial/Collector/Local	Jefferson	KY 1020 at I-264	Louisville
137	North	Urban Minor Arterial/Collector/Local	Boone	KY 237 at KY 18	Burlington
138	North	Urban Minor Arterial/Collector/Local	Scott	US 62 at US 460	Georgetown
139	North	Urban Minor Arterial/Collector/Local	Bullitt	US 31EX at KY 44	Mt. Washington
140	North	Urban Minor Arterial/Collector/Local	Kenton	KY 17 at KY 16	Independence
141	North	Urban Minor Arterial/Collector/Local	Jessamine	US 27X at Orchard Dr.	Nicholasville
142	North	Urban Minor Arterial/Collector/Local	Jefferson	KY 864 at Breckinridge	Louisville
143	North	Urban Minor Arterial/Collector/Local	Boone	Ky 3076 at Mineola Pike	Olympia
144	North	Urban Minor Arterial/Collector/Local	Boone	US 42 at US 25	Walton
145	North	Urban Minor Arterial/Collector/Local	Scott	KY 620 at US 25	Georgetown
146	North	Urban Minor Arterial/Collector/Local	Scott	KY 2906 at US 460	Georgetown
147	North	Urban Minor Arterial/Collector/Local	Kenton	KY 3070 at KY 16	Independence
148	North	Urban Minor Arterial/Collector/Local	Clark	US 60 at KY 89	Winchester
149	East	Rural Interstate	Whitley	I-75 at Exit 5	Williamsburg
150	East	Rural Interstate	Laurel	I-75 at Exit 49	London

Table 1. SURVEY LOCATIONS (continued)

<u>Site Number</u>	<u>Region</u>	<u>Functional Classification</u>	<u>County</u>	<u>Intersection Description</u>	<u>Nearest Town</u>
151	East	Rural Interstate	Carter	I-64 at Exit 156	Olive Hill
152	East	Rural Interstate	Carter	I-64 at Exit 172	Grayson
153	East	Rural Interstate	Boyd	I-64 at Exit 181	Ashland
154	East	Rural Interstate	Boyd	I-64 at Exit 185	Ashland
155	East	Rural Principal Arterial	Letcher	US 119 at KY 15	Whitesburg
156	East	Rural Principal Arterial	Bell	US 25E at KY 66	Pineville
157	East	Rural Principal Arterial	Greenup	KY 8 at US 23 Truck Route	South Portsmouth
158	East	Rural Principal Arterial	Breathitt	KY 15 at KY 30	Jackson
159	East	Rural Principal Arterial	Harlan	US 119 at Letcher Co. Line	Harlan
160	East	Rural Principal Arterial	Martin	KY 645 at KY 40	Inez
161	East	Rural Principal Arterial	Pike	KY 460 at KY 1460	Pikeville
162	East	Rural Principal Arterial	Letcher	KY 15 at KY 15X	Whitesburg
163	East	Rural Principal Arterial	Harlan	US 119 at US 421	Harlan
164	East	Rural Principal Arterial	Knox	US 25E at KY 225/3439	Barbourville
165	East	Rural Principal Arterial	Harlan	US 119 at KY 2179	Harlan
166	East	Rural Principal Arterial	Lincoln	US 27 at US 150	Stanford
167	East	Rural Minor Arterial/Major Collector	Greenup	KY 2 at US 23	Greenup
168	East	Rural Minor Arterial/Major Collector	Johnson	KY 172 at KY 40	Staffordsville
169	East	Rural Minor Arterial/Major Collector	Carter	KY 174 at US 60	Olive Hill
170	East	Rural Minor Arterial/Major Collector	Bell	KY 190 at US 25E	Pineville
171	East	Rural Minor Arterial/Major Collector	Letcher	KY 7 at KY 931	Whitesburg
172	East	Rural Minor Arterial/Major Collector	Letcher	KY 317 at KY 7	Whitesburg
173	East	Rural Minor Arterial/Major Collector	Breathitt	KY 476 at KY 15	Jackson
174	East	Rural Minor Arterial/Major Collector	Carter	US 60 at KY 7	Grayson
175	East	Rural Minor Arterial/Major Collector	Lincoln	KY 618 at KY 39	Dog Walk
176	East	Rural Minor Arterial/Major Collector	Pulaski	KY 80 at KY 837	Somerset
177	East	Rural Minor Arterial/Major Collector	Floyd	KY 1426 at KY 979	Martin
178	East	Rural Minor Arterial/Major Collector	Laurel	KY 1193 at KY 192	Baldrock
179	East	Rural Minor Collector/Local	Johnson	KY 3214 at KY 172	Paintsville
180	East	Rural Minor Collector/Local	Floyd	KY 680 at KY 122	Drift
181	East	Rural Minor Collector/Local	Whitley	KY 1481 at 204	Goldbug
182	East	Rural Minor Collector/Local	Johnson	KY 2558 at KY 302	Paintsville
183	East	Rural Minor Collector/Local	Whitley	KY 1595 at KY 92	Siler
184	East	Rural Minor Collector/Local	Adair	KY 2968 at KY 80	Columbia
185	East	Rural Minor Collector/Local	Clay	KY 638 at US 421	Manchester
186	East	Rural Minor Collector/Local	Laurel	KY 1006 at KY 192	Sublimity City
187	East	Urban Interstate/Freeway	Laurel	I-75 at Exit 38	London
188	East	Urban Interstate/Freeway	Rowan	I-64 at Exit 137	Morehead
189	East	Urban Principal Arterial	Perry	KY 15 at KY 15X	Hazard
190	East	Urban Principal Arterial	Greenup	US 23 at KY 693	Flatwoods
191	East	Urban Principal Arterial	Laurel	US 25E at I-75	Corbin
192	East	Urban Principal Arterial	Boyd	US 23 at Mall Rd.	Ashland
193	East	Urban Principal Arterial	Boyd	US 23 at US 60	Ashland
194	East	Urban Principal Arterial	Laurel	US 25E at US 25	Corbin
195	East	Urban Minor Arterial/Collector/Local	Perry	KY 451 at KY 15X	Hazard
196	East	Urban Minor Arterial/Collector/Local	Pike	KY 1460 at KY 1426	Pikeville
197	East	Urban Minor Arterial/Collector/Local	Laurel	US 25 at KY 80	Pittsboro
198	East	Urban Minor Arterial/Collector/Local	Greenup	KY 705 at KY 207	Flatwoods
199	East	Urban Minor Arterial/Collector/Local	Whitley	US 25W at KY 296	Williamsburg
200	East	Urban Minor Arterial/Collector/Local	Pulaski	KY 80 at KY 2296	Somerset

TABLE 2. USAGE RATE FOR ALL FRONT SEAT OCCUPANTS

FUNCTIONAL CLASSIFICATION	PERCENT USAGE			
	REGION			ALL
	WEST	NORTH	EAST	
Rural Interstate	70.6	64.7	62.2	65.7
Rural Principal Arterial	66.5	66.1	50.3	59.1
Rural Minor Arterial/Major Collector	51.9	58.1	42.5	50.1
Rural Minor Collector/Local	45.9	52.1	51.1	49.2
Urban Interstate/Freeway	66.8	65.0	66.0	65.2
Urban Principal Arterial	55.9	59.1	50.4	57.1
Urban Minor Arterial/Collector/Local	62.3	57.9	50.5	58.2
All	59.4	61.9	50.0	58.6

TABLE 3. USAGE RATE FOR DRIVERS

FUNCTIONAL CLASSIFICATION	PERCENT USAGE			
	REGION			ALL
	WEST	NORTH	EAST	
Rural Interstate	71.6	65.7	62.7	66.6
Rural Principal Arterial	67.1	68.1	51.3	60.1
Rural Minor Arterial/Major Collector	52.7	58.2	43.8	50.9
Rural Minor Collector/Local	46.5	53.6	51.2	49.7
Urban Interstate/Freeway	67.7	65.9	66.7	66.1
Urban Principal Arterial	56.3	59.6	51.6	57.7
Urban Minor Arterial/Collector/Local	63.7	58.6	51.3	59.1
All	60.2	62.8	50.9	59.4

TABLE 4. USAGE RATE FOR ALL FRONT SEAT PASSENGERS

FUNCTIONAL CLASSIFICATION	PERCENT USAGE			
	REGION			ALL
	WEST	NORTH	EAST	
Rural Interstate	66.0	60.7	59.8	61.8
Rural Principal Arterial	64.1	58.2	46.4	55.3
Rural Minor Arterial/Major Collector	48.8	58.0	39.1	47.6
Rural Minor Collector/Local	44.2	47.2	50.9	47.5
Urban Interstate/Freeway	62.7	61.7	64.7	61.8
Urban Principal Arterial	55.2	56.5	46.6	54.8
Urban Minor Arterial/Collector/Local	59.4	55.0	48.2	55.4
All	56.7	58.7	47.1	55.6

TABLE 5. USAGE RATE FOR CHILDREN UNDER FOUR YEARS OF AGE
(FRONT AND REAR)

FUNCTIONAL CLASSIFICATION	PERCENT USAGE			
	REGION			ALL
	WEST	NORTH	EAST	
Rural Interstate	97.9	99.5	100.0	99.2
Rural Principal Arterial	95.5	82.4	69.8	82.1
Rural Minor Arterial/Major Collector	97.4	96.1	80.4	91.1
Rural Minor Collector/Local	89.3	84.9	78.5	84.0
Urban Interstate/Freeway	91.4	92.5	89.8	92.3
Urban Principal Arterial	79.4	82.9	91.8	83.2
Urban Minor Arterial/Collector/Local	90.5	86.8	94.2	88.7
All	92.7	90.8	81.2	89.2

TABLE 6. TREND IN STATEWIDE USAGE RATES

YEAR	PERCENT USING SAFETY BELTS		
	ALL FRONT SEAT OCCUPANTS	DRIVERS	CHILDREN UNDER FOUR YEARS OF AGE*
1982	**	4	15
1983	**	6	24
1984	**	7	30
1985	9	9	29
1986	13	13	30
1988	20	21	48
1989	25	26	49
1990	33	32	57
1991	39	39	57
1992	40	41	62
1993	42	42	61
1994	58	58	72
1995	54	54	66
1996	55	55	79
1997	54	54	82
1998	54	54	80
1999	59	59	89

* Children using either safety seat or safety belt. Children seated in front or rear seat.

** Data not available.

TABLE 7. USAGE RATE BY TYPE OF VEHICLE (ALL FRONT SEAT OCCUPANTS)

FUNCTIONAL CLASSIFICATION	REGION			
	WEST	NORTH	EAST	ALL
Passengers Cars				
Rural Interstate	74.1	70.4	65.6	70.5
Rural Principal Arterial	72.6	75.8	55.0	65.0
Rural Minor Arterial/Major Collector	56.2	67.0	50.9	56.9
Rural Minor Collector/Local	51.0	60.1	53.9	53.9
Urban Interstate/Freeway	69.9	69.2	69.9	69.3
Urban Principal Arterial	59.2	63.1	52.3	60.7
Urban Minor Arterial/Collector/Local	67.0	60.9	55.8	61.9
All	63.9	66.9	55.0	63.4
Pickup Trucks				
Rural Interstate	57.1	45.0	49.8	48.8
Rural Principal Arterial	52.4	43.9	36.3	44.0
Rural Minor Arterial/Major Collector	39.7	35.5	28.9	34.9
Rural Minor Collector/Local	31.8	33.9	38.0	34.7
Urban Interstate/Freeway	47.4	44.8	47.2	45.1
Urban Principal Arterial	43.1	42.5	40.2	42.3
Urban Minor Arterial/Collector/Local	43.8	39.3	36.9	40.2
All	45.1	42.5	36.6	42.0
Vans				
Rural Interstate	69.4	72.0	64.9	70.1
Rural Principal Arterial	69.6	69.3	53.5	62.3
Rural Minor Arterial/Major Collector	58.0	61.5	42.1	53.2
Rural Minor Collector/Local	46.9	54.5	70.9	58.2
Urban Interstate/Freeway	76.5	67.0	77.7	68.2
Urban Principal Arterial	69.3	59.9	58.5	62.0
Urban Minor Arterial/Collector/Local	71.5	63.2	62.3	65.3
All	65.0	65.3	55.6	63.1
Sport Utility Vehicles				
Rural Interstate	77.7	75.0	66.4	74.1
Rural Principal Arterial	66.6	71.9	57.9	63.4
Rural Minor Arterial/Major Collector	65.7	66.2	44.4	58.3
Rural Minor Collector/Local	62.7	69.1	59.1	62.4
Urban Interstate/Freeway	78.7	72.7	69.7	73.3
Urban Principal Arterial	59.2	64.1	55.1	61.7
Urban Minor Arterial/Collector/Local	64.5	63.5	48.0	62.0
All	67.1	69.5	54.7	65.6

APPENDIX A

COUNTY POPULATIONS AND NUMBER OF DATA COLLECTION SITES

COUNTY	POPULATION	NUMBER OF SITES	REGION*
Adair	15,360	1	3
Allen	14,628	0	1
Anderson	14,571	0	2
Ballard	7,902	0	1
Barren	34,001	8	1
Bath	9,692	0	3
Bell	31,506	2	3
Boone	57,589	9	2
Bourbon	19,236	0	2
Boyd	51,150	4	3
Boyle	25,641	2	2
Bracken	7,766	0	2
Breathitt	15,703	2	3
Breckinridge	16,312	1	1
Bullitt	47,567	3	2
Butler	11,245	0	1
Caldwell	13,232	0	1
Calloway	30,735	1	1
Campbell	83,866	5	2
Carlisle	5,238	0	1
Carroll	9,292	0	2
Carter	24,340	4	3
Casey	14,211	0	3
Christian	68,941	2	1
Clark	29,496	4	2
Clay	21,746	1	3
Clinton	9,135	0	3
Crittenden	9,196	0	1
Cumberland	6,784	0	3
Daviess	87,189	3	1
Edmonson	10,357	0	1
Elliott	6,455	0	3
Estill	14,614	0	3
Fayette	225,366	5	2
Fleming	12,292	0	3
Floyd	43,586	1	3
Franklin	43,781	2	2
Fulton	8,271	0	1
Gallatin	5,393	0	2
Garrard	11,579	0	2
Grant	15,737	1	2

COUNTY	POPULATION	NUMBER OF SITES	REGION*
Graves	33,550	1	1
Grayson	21,050	4	1
Green	10,371	0	1
Greenup	36,742	4	3
Hancock	7,864	0	1
Hardin	89,240	7	1
Harlan	36,574	3	3
Harrison	16,248	0	2
Hart	14,890	0	1
Henderson	43,044	3	1
Henry	12,823	0	2
Hickman	5,566	0	1
Hopkins	46,126	3	1
Jackson	11,955	0	3
Jefferson	664,937	20	2
Jessamine	30,508	3	2
Johnson	23,248	3	3
Kenton	142,031	7	2
Knott	17,906	0	3
Knox	29,676	1	3
Larue	11,679	0	1
Laurel	43,438	7	3
Lawrence	13,998	0	3
Lee	7,422	0	3
Leslie	13,642	0	3
Letcher	27,000	4	3
Lewis	13,029	0	3
Lincoln	20,045	2	3
Livingston	9,062	0	1
Logan	24,416	4	1
Lyon	6,624	0	1
McCracken	62,879	9	1
McCreary	15,603	0	3
McLean	9,628	0	1
Madison	57,508	0	2
Magoffin	13,077	0	3
Marion	16,499	2	1
Marshall	27,205	5	1
Martin	12,526	1	3
Mason	16,666	0	3
Meade	24,170	2	1

COUNTY	POPULATION	NUMBER OF SITES	REGION*
Menifee	5,092	0	3
Mercer	19,148	1	2
Metcalfe	8,963	0	1
Monroe	11,401	0	1
Montgomery	19,561	3	2
Morgan	11,648	0	3
Muhlenberg	31,318	3	1
Nelson	29,710	1	1
Nicholas	6,725	0	3
Ohio	21,105	0	1
Oldham	33,263	4	2
Owen	9,035	0	2
Owsley	5,036	0	3
Pendelton	12,036	0	2
Perry	30,283	2	3
Pike	72,583	2	3
Powell	11,686	0	3
Pulaski	49,489	2	3
Robertson	2,124	0	2
Rockcastle	14,803	1	3
Rowan	20,353	1	3
Russell	14,716	0	3
Scott	23,867	7	2
Shelby	24,824	3	2
Simpson	15,145	2	1
Spencer	6,801	0	2
Taylor	21,146	2	1
Todd	10,940	0	1
Trigg	10,361	0	1
Trimble	6,090	0	2
Union	16,557	0	1
Warren	76,673	3	1
Washington	10,441	0	1
Wayne	17,468	0	3
Webster	13,955	0	1
Whitley	33,326	4	3
Wolfe	6,503	0	3
Woodford	19,955	3	2
TOTALS	3,685,278	200	

* Region 1 - West; Region 2 - North; Region 3 - East

APPENDIX B

RELATIVE ERROR AND CONFIDENCE INTERVAL FOR USAGE FOR ALL FRONT SEAT PASSENGERS

TABLE B-1. RELATIVE ERROR FOR DATA FOR ALL FRONT SEAT OCCUPANTS

FUNCTIONAL CLASSIFICATION	RELATIVE ERROR*			
	REGION			ALL
	WEST	NORTH	EAST	
Rural Interstate	4.9	3.6	4.4	2.6
Rural Principal Arterial	2.5	6.4	3.6	2.1
Rural Minor Arterial/Major Collector	4.7	4.6	6.2	3.0
Rural Minor Collector/Local	6.3	6.4	5.9	3.7
Urban Interstate/Freeway	2.9	1.9	5.5	1.7
Urban Principal Arterial	4.2	1.9	4.6	1.7
Urban Minor Arterial/Collector/Local	3.1	3.0	4.3	2.1
All	1.6	1.2	2.2	0.8

* Percent (0.95 probability)

TABLE B-2. CONFIDENCE INTERVAL FOR DATA FOR ALL FRONT SEAT OCCUPANTS

FUNCTIONAL CLASSIFICATION	CONFIDENCE INTERVAL*			
	REGION			ALL
	WEST	NORTH	EAST	
Rural Interstate	3.4	2.4	2.8	1.7
Rural Principal Arterial	1.7	4.2	1.8	1.2
Rural Minor Arterial/Major Collector	2.5	2.7	2.6	1.5
Rural Minor Collector/Local	2.9	3.4	3.0	1.8
Urban Interstate/Freeway	1.9	1.2	3.6	1.1
Urban Principal Arterial	2.3	1.1	2.3	1.0
Urban Minor Arterial/Collector/Local	1.9	1.7	2.2	1.2
All	1.0	0.7	1.1	0.5

* Percentage with 0.95 probability.

APPENDIX C

SUMMARY OF DATA

TABLE C-1. SUMMARY OF DATA

ALL FRONT SEAT OCCUPANTS					CATEGORY					
LOCATION NUMBER	Sample	Percent Usage	RELATIVE ERROR*	CONFIDENCE INTERVAL*	DRIVERS		FRONT SEAT PASSENGERS		UNDER FOUR (FRONT AND REAR)	
					Sample	Percent Usage	Sample	Percent Usage	Sample	Percent Usage
1	193	74	8.5	6.2	164	73	29	79	1	100
2	39	77	17.2	13.2	27	78	12	75	0	N/A
3	162	73	9.4	6.8	98	73	64	72	0	N/A
4	270	67	8.4	5.6	230	69	40	58	0	N/A
5	872	71	4.3	3.0	491	71	381	70	16	88
6	216	72	8.3	6.0	183	72	33	73	1	100
7	212	66	9.7	6.4	157	67	55	64	1	100
8	202	71	8.8	6.2	161	73	41	66	1	100
9	201	70	9.1	6.4	163	69	38	74	2	100
10	566	51	8.1	4.1	454	52	112	45	6	100
11	1324	63	4.1	2.6	1084	64	240	59	14	86
12	1122	63	4.4	2.8	748	64	374	63	24	83
13	279	73	7.2	5.2	248	74	31	65	1	100
14	365	62	8.0	5.0	295	62	70	63	4	100
15	292	71	7.3	5.2	207	72	85	68	2	100
16	570	69	5.4	3.8	454	71	116	62	7	100
17	519	56	7.7	4.3	408	57	111	52	6	83
18	711	61	5.8	3.6	542	61	169	62	3	100
19	891	68	4.5	3.1	668	69	223	65	17	88
20	491	60	7.1	4.3	382	59	109	64	3	67
21	803	40	8.5	3.4	607	39	196	43	14	93
22	214	50	13.5	6.7	175	49	39	51	3	67
23	582	46	8.7	4.1	395	47	187	45	8	88
24	202	62	10.7	6.7	155	65	47	55	3	100
25	458	54	8.4	4.6	387	56	71	45	8	88
26	531	49	8.6	4.3	447	49	84	48	7	100
27	895	49	6.7	3.3	732	50	163	43	26	88
28	367	47	10.8	5.1	293	51	74	34	3	100
29	833	51	6.7	3.4	637	51	196	49	10	90
30	300	45	12.6	5.6	238	45	62	44	4	100
31	369	40	12.6	5.0	292	40	77	38	9	78
32	178	58	12.5	7.3	111	59	67	57	2	100
33	599	42	9.4	4.0	519	43	80	36	12	83
34	70	26	39.8	10.2	59	27	11	18	0	N/A
35	82	61	17.3	10.6	40	70	42	52	1	0
36	125	46	18.8	8.7	100	48	25	40	0	N/A
37	680	47	7.9	3.8	450	47	230	48	16	88
38	516	48	8.9	4.3	401	48	115	50	8	100
39	41	32	44.9	14.2	28	32	13	31	0	N/A
40	85	29	32.9	9.7	67	30	18	28	0	N/A
41	374	65	7.4	4.8	284	68	90	57	5	80
42	567	78	4.4	3.4	391	77	176	79	7	86
43	363	56	9.1	5.1	295	57	68	53	5	100
44	544	64	6.3	4.0	469	64	75	61	8	88
45	792	69	4.6	3.2	649	70	143	65	9	100
46	435	72	5.8	4.2	367	73	68	69	2	100
47	1438	67	3.6	2.4	1088	68	350	64	24	79
48	898	59	5.4	3.2	786	60	112	57	19	84
49	1355	52	5.1	2.7	1037	51	318	53	12	83
50	1073	46	6.5	3.0	827	46	246	47	17	76

TABLE C-1. SUMMARY OF DATA (continued)

ALL FRONT SEAT OCCUPANTS					CATEGORY					
LOCATION NUMBER	Sample	Percent Usage	RELATIVE ERROR*	CONFIDENCE INTERVAL*	DRIVERS		FRONT SEAT PASSENGERS		UNDER FOUR (FRONT AND REAR)	
					Sample	Percent Usage	Sample	Percent Usage	Sample	Percent Usage
51	868	56	6.0	3.3	664	55	204	56	11	82
52	909	55	5.9	3.2	594	54	315	57	29	90
53	291	45	12.8	5.7	192	46	99	42	9	78
54	737	56	6.4	3.6	518	57	219	55	9	78
55	599	51	7.8	4.0	409	51	190	52	20	95
56	1032	65	4.4	2.9	819	66	213	64	15	80
57	821	68	4.7	3.2	651	67	170	70	21	100
58	264	53	11.4	6.0	207	52	57	54	7	86
59	65	54	22.5	12.1	58	59	7	14	1	100
60	581	53	7.6	4.1	478	54	103	50	8	100
61	238	53	11.9	6.3	182	55	56	48	15	60
62	285	64	8.7	5.6	167	72	118	53	14	71
63	436	51	9.3	4.7	325	50	111	54	13	100
64	438	65	6.9	4.5	359	65	79	65	12	100
65	397	65	7.2	4.7	292	66	105	63	2	100
66	458	53	8.6	4.6	365	56	93	43	12	92
67	485	72	5.6	4.0	442	72	43	72	2	100
68	769	61	5.7	3.4	588	60	181	63	12	92
69	354	71	6.7	4.7	298	72	56	66	1	100
70	369	57	8.8	5.0	298	58	71	55	3	100
71	367	66	7.3	4.8	278	67	89	64	6	100
72	267	66	8.6	5.7	236	68	31	52	0	N/A
73	187	65	10.5	6.8	145	70	42	50	2	100
74	207	75	7.9	5.9	146	74	61	77	1	100
75	292	54	10.6	5.7	242	54	50	52	4	100
76	278	64	8.7	5.6	232	65	46	61	2	100
77	200	70	9.2	6.4	166	67	34	79	1	100
78	113	63	14.2	8.9	94	65	19	53	0	N/A
79	666	61	6.1	3.7	549	63	117	51	3	67
80	577	68	5.5	3.8	466	70	111	61	9	89
81	263	60	9.9	5.9	206	62	57	54	1	100
82	132	67	12.1	8.0	104	69	28	57	4	75
83	544	65	6.2	4.0	440	65	104	63	4	100
84	1569	52	4.8	2.5	1287	52	282	50	30	77
85	138	64	12.4	8.0	108	63	30	70	6	100
86	203	63	10.6	6.7	162	62	41	63	1	100
87	353	46	11.3	5.2	281	46	72	49	0	N/A
88	401	62	7.7	4.8	316	61	85	64	2	100
89	57	51	25.5	13.0	46	50	11	55	0	N/A
90	214	43	15.6	6.6	169	46	45	31	15	80
91	384	42	11.8	4.9	284	42	100	40	8	100
92	540	50	8.5	4.2	397	51	143	46	5	100
93	206	50	13.7	6.8	162	52	44	41	1	0
94	649	66	5.5	3.6	531	66	118	68	8	88
95	182	45	16.0	7.2	139	47	43	40	1	100
96	50	26	46.8	12.2	41	27	9	22	0	N/A
97	81	31	32.6	10.1	63	32	18	28	2	50
98	209	51	13.2	6.8	165	50	44	57	2	50
99	81	52	21.0	10.9	62	55	19	42	1	100
100	390	59	8.2	4.9	305	61	85	53	9	89

TABLE C-1. SUMMARY OF DATA (continued)

ALL FRONT SEAT OCCUPANTS					CATEGORY					
LOCATION NUMBER	Sample	Percent Usage	RELATIVE ERROR*	CONFIDENCE INTERVAL*	DRIVERS		FRONT SEAT PASSENGERS		UNDER FOUR (FRONT AND REAR)	
					Sample	Percent Usage	Sample	Percent Usage	Sample	Percent Usage
101	139	47	17.5	8.3	109	50	30	37	3	67
102	873	68	4.6	3.1	776	68	97	67	16	100
103	684	69	5.1	3.5	545	70	139	64	9	78
104	452	68	6.4	4.3	360	73	92	49	7	100
105	354	60	8.5	5.1	276	60	78	60	6	67
106	594	67	5.6	3.8	471	68	123	67	3	100
107	239	56	11.2	6.3	187	59	52	44	3	100
108	698	69	5.0	3.4	587	69	111	70	18	94
109	502	64	6.5	4.2	381	66	121	60	6	100
110	976	68	4.3	2.9	856	69	120	65	26	92
111	677	68	5.2	3.5	541	69	136	66	10	100
112	345	65	7.8	5.0	288	66	57	61	4	100
113	852	71	4.3	3.1	672	71	180	69	15	87
114	771	68	4.8	3.3	627	68	144	69	8	100
115	685	74	4.4	3.3	579	75	106	73	9	100
116	428	67	6.7	4.5	363	68	65	60	14	93
117	781	63	5.4	3.4	613	64	168	57	6	100
118	647	65	5.7	3.7	508	66	139	60	4	50
119	255	55	11.1	6.1	209	56	46	48	5	80
120	489	52	8.6	4.4	403	52	86	50	6	83
121	1378	54	4.8	2.6	1097	55	281	53	21	95
122	695	52	7.2	3.7	588	53	107	47	10	90
123	568	64	6.1	3.9	500	67	68	43	0	N/A
124	608	54	7.4	4.0	464	53	144	57	8	100
125	543	59	7.0	4.1	413	60	130	55	12	83
126	1384	71	3.4	2.4	1166	71	218	67	18	61
127	515	58	7.3	4.3	440	59	75	55	7	71
128	332	52	10.4	5.4	268	53	64	47	0	N/A
129	702	71	4.7	3.4	562	71	140	71	6	100
130	1019	52	5.9	3.1	834	53	185	48	11	64
131	933	56	5.7	3.2	746	57	187	54	10	70
132	554	63	6.3	4.0	456	64	98	58	9	100
133	506	49	8.9	4.4	385	47	121	55	8	88
134	711	50	7.4	3.7	557	52	154	44	15	87
135	982	59	5.3	3.1	787	60	195	54	12	92
136	449	53	8.8	4.6	356	52	93	54	0	N/A
137	461	67	6.4	4.3	361	66	100	70	5	100
138	416	65	7.0	4.6	360	65	56	66	9	89
139	784	61	5.6	3.4	642	64	142	47	17	71
140	845	51	6.6	3.4	666	54	179	42	15	73
141	851	49	6.8	3.4	688	50	163	45	6	100
142	361	47	10.9	5.1	296	48	65	43	0	N/A
143	580	64	6.0	3.9	490	65	90	62	6	100
144	1057	56	5.3	3.0	840	57	217	52	12	75
145	810	57	6.0	3.4	698	56	112	61	11	100
146	322	61	8.8	5.3	252	60	70	63	2	100
147	623	59	6.5	3.9	504	59	119	58	6	83
148	1117	43	6.8	2.9	880	45	237	35	23	70
149	549	60	6.9	4.1	450	60	99	58	6	100
150	78	60	18.0	10.9	58	60	20	60	0	N/A

TABLE C-1. SUMMARY OF DATA (continued)

ALL FRONT SEAT OCCUPANTS					CATEGORY					
LOCATION NUMBER					DRIVERS		FRONT SEAT PASSENGERS		UNDER FOUR (FRONT AND REAR)	
	Sample	Percent Usage	RELATIVE ERROR*	CONFIDENCE INTERVAL*	Sample	Percent Usage	Sample	Percent Usage	Sample	Percent Usage
151	245	67	8.9	5.9	203	67	42	62	1	100
152	435	62	7.4	4.6	360	62	75	60	3	100
153	309	70	7.3	5.1	251	71	58	66	2	100
154	297	67	8.0	5.3	239	67	58	69	0	N/A
155	603	44	9.0	4.0	452	45	151	42	9	78
156	825	51	6.7	3.4	614	53	211	47	7	100
157	436	50	9.5	4.7	332	50	104	49	2	50
158	356	58	8.9	5.1	279	59	77	55	0	N/A
159	173	47	15.9	7.4	141	48	32	44	2	0
160	407	47	10.3	4.8	286	49	121	44	5	60
161	669	54	7.1	3.8	570	55	99	43	4	75
162	532	54	7.8	4.2	437	55	95	53	3	100
163	614	44	9.0	3.9	462	45	152	41	7	71
164	985	51	6.2	3.1	692	52	293	48	20	65
165	265	44	13.6	6.0	205	45	60	38	0	N/A
166	786	52	6.7	3.5	609	52	177	54	13	77
167	251	41	14.9	6.1	187	41	64	39	4	100
168	402	47	10.4	4.9	290	47	112	46	9	100
169	207	43	15.7	6.7	150	42	57	46	0	N/A
170	276	47	12.4	5.9	205	46	71	51	0	N/A
171	120	40	21.9	8.8	92	43	28	29	0	N/A
172	161	33	22.0	7.3	127	35	34	26	1	100
173	138	32	24.4	7.8	101	35	37	24	1	0
174	762	46	7.7	3.5	564	46	198	45	11	91
175	107	44	21.4	9.4	86	41	21	57	1	100
176	200	51	13.7	6.9	137	50	63	51	1	100
177	322	41	13.1	5.4	236	41	86	41	6	33
178	73	42	26.7	11.3	38	55	35	29	2	100
179	63	43	28.5	12.2	46	46	17	35	2	100
180	251	47	13.1	6.2	173	46	78	49	3	33
181	69	43	26.9	11.7	54	46	15	33	0	N/A
182	25	36	52.3	18.8	17	41	8	25	1	100
183	65	40	29.8	11.9	50	44	15	27	2	100
184	43	37	38.8	14.4	36	39	7	29	0	N/A
185	377	56	9.0	5.0	123	65	254	51	5	80
186	672	56	6.7	3.8	500	55	172	58	8	100
187	611	66	5.6	3.7	398	67	213	65	10	90
188	414	59	8.0	4.7	302	61	112	55	8	88
189	718	44	8.3	3.6	557	46	161	37	11	91
190	954	59	5.3	3.1	774	60	180	54	12	92
191	494	58	7.5	4.4	332	58	162	57	3	100
192	855	61	5.4	3.3	686	59	169	66	7	71
193	903	59	5.5	3.2	732	57	171	65	6	83
194	574	60	6.6	4.0	421	61	153	59	3	100
195	699	47	7.9	3.7	516	50	183	38	17	59
196	406	53	9.2	4.9	306	53	100	52	4	100
197	907	51	6.3	3.3	679	51	228	51	10	90
198	505	47	9.2	4.4	404	48	101	43	4	100
199	812	51	6.7	3.4	609	52	203	50	5	100
200	847	48	7.1	3.4	675	48	172	48	12	92

* Percentage (using 0.95 probability)